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U.S.
DEPARTMENT
of
AGRICULTURE
SOIL
CONSERVATION
SERVICE

THE JULIANSON MUSEUM FOR ROTIMON



THE
JULIANSON
MUSEUM
FOR
ROTIMON



Americus, Georgia
August 1, 1935.

To All Farmers
Muckalee Creek Soil Conservation Project
Georgia

Dear Sirs:-

As a means of outlining in detail the various phases of the Soil Conservation Program, this soil conservation plan for a typical farm in the Muckalee Creek area has been prepared, which includes the various problems encountered in controlling soil erosion. Practically every farm in the Upper Coastal Plains and Middle Coastal Plains Sections in Georgia have some or all of the problems found on this farm.

The Soil Conservation Service of the United States Department of Agriculture has established two large soil conservation demonstrations in Georgia; one in the Piedmont Section at Athens and the other in the Upper Coastal Plains Section at Americus. In addition to these two projects three others will be established at an early date. One in Troup County, one in Hall and White Counties, and one in Floyd and Polk Counties. There are eleven CCC camps now being established in the state for the purpose of conducting soil conservation work on lands adjacent to each camp.

It is the purpose of all of these projects to carry out a complete soil conservation and land-use program in cooperation with the farmers in each area which will serve as a demonstration for the benefit of the entire state.

The losses from soil erosion are visible on every hand and the necessity for carrying on a definite soil conservation program is emphasized by the extent of damage that has already taken place. The combined effects of sheet erosion and gullyng are constantly depleting our soils of plant food by stripping the rich top soil from our fields. Sheet erosion has removed from one fourth to three fourths of the top soil from forty-two per cent and over three fourths of the top soil from sixteen per cent of the farm land in Georgia. In addition to these losses fifty-three per cent of the farm land is affected by gullyng with a total of over two million acres completely destroyed.

The Atlanta Journal commenting editorially on the Soil Conservation program said:

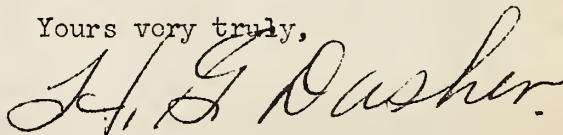
"To check and prevent the continued washing-away of Georgia's top soil is to save her agricultural future. Millions of acres of once productive land have been eroded to such an extent that they are now, if not altogether barren, so impoverished that the families dwelling on them can barely eke out an existence. Other large areas have been virtually destroyed, so far as farm uses are concerned, and still others, now fertile, face a like danger.

"The projects conducted by the Government's Soil Conservation Service demonstrates just how these losses can be stopped and how a great deal of the damage done can be repaired."

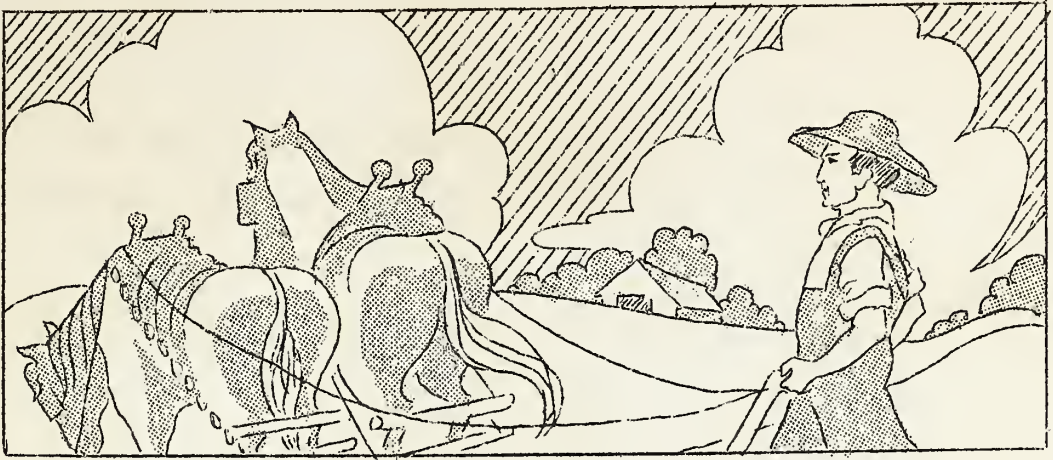
A complete soil conservation and land-use program must include a combination of terracing, contour tillage, strip cropping, land retirement, reforestation, crop rotations, and soil building crops. All of these factors have been considered in making this plan.

We want to take this opportunity to express our appreciation for the splendid cooperation that has been accorded the Soil Conservation project by the farmers in the area and we assure you that our staff of specialists stands ready at all times to continue to work with you in solving the most important problem on the farm today - that of controlling soil erosion.

Yours very truly,

A handwritten signature in dark ink, appearing to read "H. G. Dasher". The signature is fluid and cursive, with the first letters of the first and last names being capitalized and prominent.

Assistant Regional Director.



SOIL CONSERVATION AND LAND-USE PLAN FOR A TYPICAL FARM

This outline for a soil conservation plan on a typical farm of 150 acres in the Muckalee Creek Area has been prepared to furnish cooperators with detailed information relative to the soil conservation work and to explain the maps and land-use program that has been prepared for his own farm.

After the farmer has requested the Soil Conservation Service to cooperate in planning and carrying out erosion control measures on his farm, the Soils Technician visits him and makes a complete soil and erosion survey of his farm with recommendations covering the proper erosion control measures necessary. As a basis for planning erosion control a soils and erosion map is prepared showing the area covered by each soil type, the extent and degree of erosion and the degree of slope.

Soil Type:

All of the above conditions are indicated on the map by means of letters and figures for reference. The soil types on the farm described herein are designated on the map (page 6) as follows:

- R1 Ruston sand
- R2 Ruston Loamy sand
- R3 Ruston sandy loam
- G3 Greenville sandy loam
- C3 Cuthbert sandy loam
- N3 Norfolk Sandy loam
- P3 Plummer sandy loam
- S3 Susquehanna sandy loam

Land Use:

The present use that is being made of each field is indicated by:

- X Idle Land
- F Forest
- P Pasture

- XP Idle land that is fenced and used as
pasture
PF Wooded land fenced and used as pasture

Slope:

The degree of slope for each area is shown by letters:

- A Slope from 0 to 3%
B Slope from 3% to 7%
C Slope from 7% to 12%
D Slope over 12%

Erosion:

The extent and amount of erosion is shown by figures, Sheet erosion describes the condition where the top soil has been washed away more or less evenly and is classified into five divisions as determined by the per cent of top soil that has been lost.

- 1 No erosion
2 Up to 25% of the top soil removed
3 From 25% to 50% of the top soil removed
33 From 50% to 75% of the top soil removed
4 Over 75% of the top soil removed

Gullying:

The size and extent of gullies is also shown by figures:

- 7 One to three gullies per acre
8 Three or more gullies per acre -
9 Land destroyed by a network of small
gullies or by one large gully.
V Deep gullies

Recommendations:

The Soils Technician also includes recommendations for the treatment for each tract. Green lines are shown to separate areas requiring different treatments and the recommendations for each tract are shown by green letters on the Soil Map that is given to the cooperator. (The lines separating the areas having similar recommendations are omitted from this map. Letters designating the treatments are typed in each division.)

- T Land needs terracing
C Contour furrowing needed
S Strip cropping necessary
N Land should be removed from cultivation

- M Additional cover needed,- land to be seeded solid and trees planted
- T-S Land needs terracing and strip crops
- C-S Land needs only contour farming and strip crops
- G Gully work necessary,- check dams, and vegetative control by planting vines and trees

By checking the figures on the soils and erosion map, the condition of each section of the farm may be described.

One of the areas on the north side of the farm (see map) contains the following symbols:

$$\begin{array}{c} \text{R1X} \\ \hline \text{C } 27\text{V} \end{array}$$

These symbols indicate the following conditions:

(a) The letter and figure "R1" tell the type of soil. By referring to the map it will be found that R1 is the symbol for Ruston sand.

(b) "X" shows that the land is idle.

(c) The letter below the line "C" indicates that the slope on that part of the field is from 7% to 12%.

(d) The next figure below the line "2" means that the field shows moderate sheet erosion with from 0 to 25% of the top soil removed.

(e) The last figure below the line, "7" signifies the extent of the gully damage. Occasional gullies are found in this field, - from one to three per acre.

(f) "V" shows that there are deep gullies.

The condition of any field may be determined by referring to the symbols on the map and checking with the index given above.



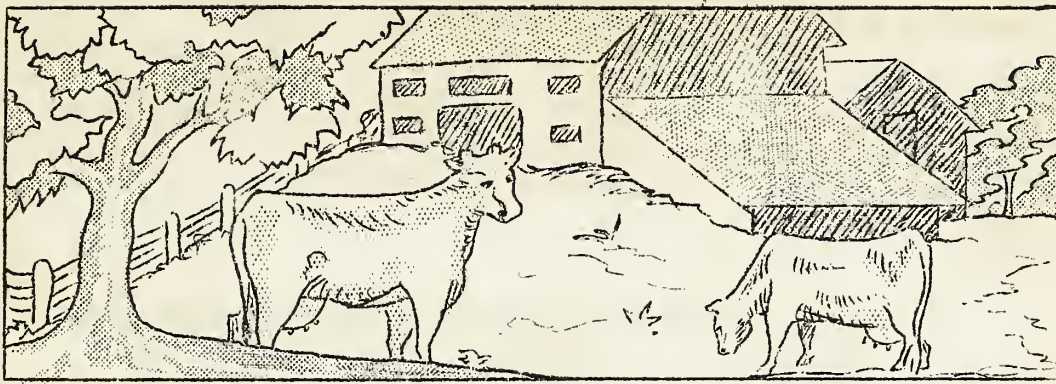
✱————✱————

—X—X—

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^a $\chi^2 = 0.96$, d.f. = 1, $p = 0.33$. $\chi^2 = 0.87$, d.f. = 1, $p = 0.35$.

— 2



LAND-USE PLANS

After the farmer owning the land in the Muckalee Creek Area has expressed the desire to cooperate with the Soil Conservation Service in the five-year demonstrational and experimental program trained engineers take an aerial photograph on which the farm is situated and locates the land lines. The map is then given to the Soils Department.

Immediately after the Soils Technicians have classified the soils on the farm according to type, degree of erosion and existing cover or use of the land, the map is given to the Erosion Specialist. With that sketch, the specialist asks the farmer to accompany him in the complete inspection of each portion of the farm. If the farmer desires to cooperate in the Soil Conservation Program he enters into a five-year cooperative agreement with the Soil Conservation Service. This agreement sets out in detail the work that is to be carried out by both parties.

With the Soils and Erosion Map as a guide, a Land-Use Plan is prepared by the farmer and Erosion Specialist. This plan is designed to meet the economic conditions necessary in the operation of the farm and at the same time to afford the maximum provisions for erosion control. As each problem arises in the field regarding seeding, strip crops, land retirement, terracing, etc., the Erosion Specialist explains each question in detail.

The Soil Conservation Service agrees to furnish a portion of the labor, materials, and equipment in certain cases for the construction of gully structures, terraces, and discharge channels, and in addition for demonstration and experimental purposes, fertilizer and seeds for cover crops for erosion control and soil improvement.

LAND-USE MAP

12 A.	14 A.	12 A.
R	R	R
S-25%- 1 3/4 A.	S-20%- 2 3/4 A.	C
C	T-13 A.	G
G	C	F-6 1/2 A.
D-43 lbs. sericea and Kobe Lespedeza	V-1/2 A. Kudzu	A-6 1/2 A.
Z-300 lbs Fert.	A-1/2 A.	
F-5A	D-112 lbs. Hairy Vetch	
A-5A		

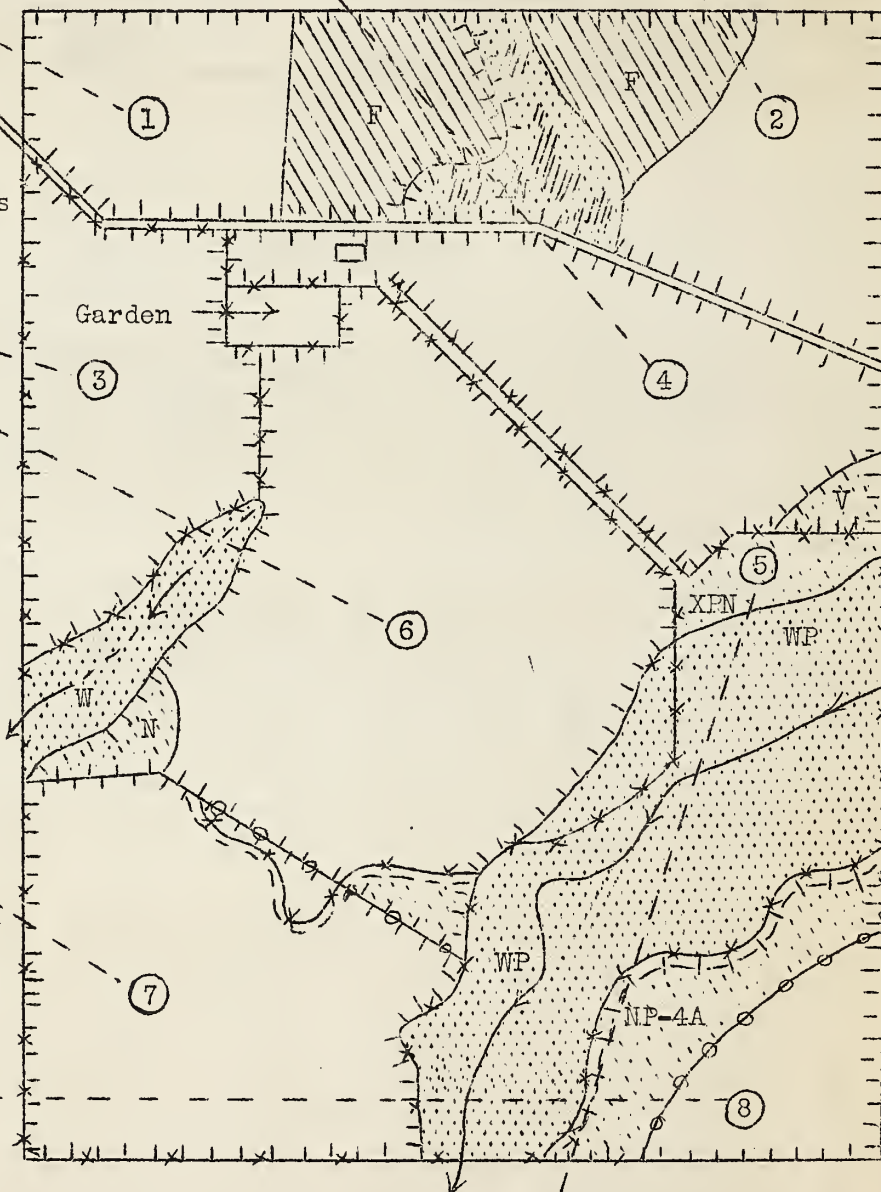
12 A.
R
S-20%-2.4 A.
T-12 A
C
D-48 lbs. Soy Beans
48 lbs. Sudan Grass
Z-500 lbs. Fert.

29 A.
R
S-33 1/3%-9A
T-27A
C
G
D-38 lbs Crotalaria
Z-300 lbs. Fert.
N-1 1/2 A.
A-2 1/2 A.
V-1A.

20 A.
R
S-20%-4A.
T-20 A.
C
D-120 lbs. Velvet
Beans
120 lbs. Cowpwas

8 A.
R
S-20%
T-4A.
C
NP-4A.
A-4A
D-100 lbs. pasture mixture
40 lbs. Austrain Winter Peas
Z-800 lbs. Complete Fert.
200 lbs. Acid Phosphate

2 A.
PN-2A
K
D-50 lbs P.Mix.
Z-400 lbs. Fert.



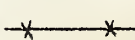
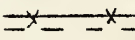
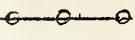
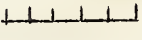
LAND-USE MAP

On the Land-Use Map, each field is numbered and a circle drawn around the number. From each circle a line is carried toward the margin of the paper. Near the margin, the number of acres in the field is written above the corresponding line. Below the line a series of symbols indicates the field treatments to be followed.

Crop Rotation:

The first symbol is usually "R" indicating that crop rotation is recommended. Everyone knows that it is not best to keep growing one kind of crop on the same field. The change should be made each year or each second year. On the Muckalee Creek Area, cotton, corn, peanuts, and watermelons, together with small grains, velvet beans, cowpeas, Austrian winter Peas, hairy vetch and other soil improving and cover crops will be grown. Crop rotations should be planned to include winter cover crops on all land in cultivation where it is possible to do so. Summer legumes should be planted in corn and should follow the small grains. This will make a complicated series of rotations when fitted to each farm. This can be simplified by using all grain in strips and dividing the remaining land so that the same kind of crop is not used on the land more than two years in succession. Crop rotation should be practiced on fields 1,2, 3,4, 6, 7, and 8.

EXPLANATION OF SYMBOLS USED ON LAND-USE MAP

A	Land removed from cultivation	Field numbers	(2)
C	Contour tillage required		
D	Seed required	Old fence, stationery	
F	Forest, New		
G	Gully Control work needed		
K	Contour furrowing needed	Old fence, removed	
N	To be seeded or planted to sod		
P	Pasture	Fence, relocated	
R	Crop rotation required		
S	Strip crops required		
T	Terraces required	Field boundaries	
V	Shrubs and vines for erosion control needed		
W	Forest, Old		
X	Idle land		
Z	Fertilizer needed		
AX	Idle land with adequate natural cover		

Strip Cropping:

The second symbol "S" means strip crops should be used. Strip crops are bands of thick growing crops planted on contour lines used to prevent erosion. The percentage of each field to be planted in strip crops and the acreage is given beside each symbol. On an average the strips will be from fifteen to thirty-five feet in width, depending on the number of strips in the field. When this acreage of grain and other thick growing winter crops are distributed over each field, the remaining acres are divided between the other crops to be grown. The next year the strip crops are moved to new locations and the land in other crops changed. Strip crops are to be planted on fields 1, 3, 4, 6, 7, and 8.

Terracing:

The symbol "T" indicates that a terracing system will be constructed. The Soil Conservation Service advocates a modified form of the Mangum terrace with from two thirds to three fourths of the soil that goes into the ridge being moved from the upper side of the terrace. These terrace ridges when completed should be approximately 18 feet wide and should have an effective height of approximately 20 inches. Incorporated into the terrace system will be one or more outlet channels, stabilized by mechanical structures where necessary, to conduct the water from the terrace down to a stabilized grade. Terrace work will be done in fields 3, 4, 6, 7, and 8.

Contour Tillage:

Contour tillage (designated by "C") signifies that the rows occupying cultivated crops should follow the contour lines of the field. All terraced land should have rows planted parallel with the terraces to prevent erosion and A slopes (slopes of less than three per cent) should be planted with rows parallel with contour lines. Contour tillage is recommended on fields 1, 2, 3, 4, 6, 7, and 8.

Seeds:

Under "D" is listed the various seed required.

Fertilizer:

The fertilizer recommended is shown opposite "Z".

Land Retirement:

Under this heading ("A" on the map) is included all of the land to be retired to forest ("F"), new pasture ("NP"), seeded solid ("N"), and planted to vines ("V"),- or the combined area removed from cultivation. This includes land to be planted to trees in fields 1 and 2, eleven and one-half acres; one-half acre to be planted with Kudzu in field 4; one and one-half acres in field 6; two acres in field 5 and four acres in field 8 to be seeded solid.

The fence is being relocated between fields 6 and 7 to make straight dividing line between them. A new fence is located in field 8 to separate the pasture land from the cultivated land.

Land with a D slope (12% or more) is always recommended to be removed from cultivation in this area, regardless of soil types or erosion. No satisfactory method of erosion control has been found on land with that slope on the prevailing soil types. Generally the deep, sandy soils can be protected by contour farming and strip cropping. Terraces are seldom recommended on these soils. It is not recommended that A slopes (0 to 3%) be terraced and in some cases, on the sandy slopes (3% to 7%) can be controlled by contour plowing and strip cropping. However, on the heavier soils and clay land, terraces and strip cropping are generally recommended on the B and C slopes (7% to 12%). Where the erosion is very severe on these heavier soils, it is recommended that such land be removed from cultivation for a period of several years, planting the land with some thick growing crop.

ENGINEERING WORK

During the time when the farm management specialist and the land owner or operator are completing the cooperative agreement together with the plans and recommendations indicated on the land use map, an engineer has made a visit to the farm and has determined in a general way what his contribution to the erosion control program may be. With the land-use map together with the first-hand knowledge gained by a personal reconnaissance survey he has an adequate conception of each step to be taken toward the final objective, also a knowledge of what the other agencies will contribute to the program.

With this information the engineer proceeds to carry out his part of the plan. His contribution in general consists of a terracing system in the fields where the degree of slope and extent of erosion warrants such, and the installation of mechanical structures where necessary to control active erosion.

Gully Control Work:

The Erosion Specialist indicates the locations where gully control work is required by "G" on the map. This work includes mechanical structures such as baffle dams, of rock, wire, brush, or other material.

Solid Planting:

Areas that have been severely damaged by sheet erosion or by small gullies should be seeded with a thick growing crop or sodded down for soil improvement. Areas requiring this treatment are designated by "N" to be removed from cultivation for at least five years. Parts of fields 5, 6, and 8 are shown as requiring sodding.

Vegetative Erosion Control:

Severely eroded areas should be planted with erosion resisting vegetation. (Indicated by "V" on the map) Kudzu and honeysuckle are among the best plants for this purpose, making a close growing and permanent cover. These two species are also used for planting gullies to stabilize erosion. Part of field 4 is to be planted with Kudzu.

Pasture Improvement:

Pasture improvement ("PN") is indicated where an existing pasture requires additional treatment to provide ample erosion prevention cover. The north end of field 5 and part of field 8 are to be planted in permanent pasture.

Reforestation:

All areas marked out on the map with slanting lines are to be planted to various species of tree seedlings. As shown in parts of fields 1 and 2. These areas are composed mainly of Ruston sard, a very poor type of soil, are severely eroded with large gullies and contain a considerable area of D slope (over 12%) which is too steep for cultivation. Slash and long leaf pine will be used because of the commercial value after reaching merchantable size. Black locust and various other species may be used as required. Wooded areas that are now poorly stocked will be replanted and the operator will be assisted in woodlot management.

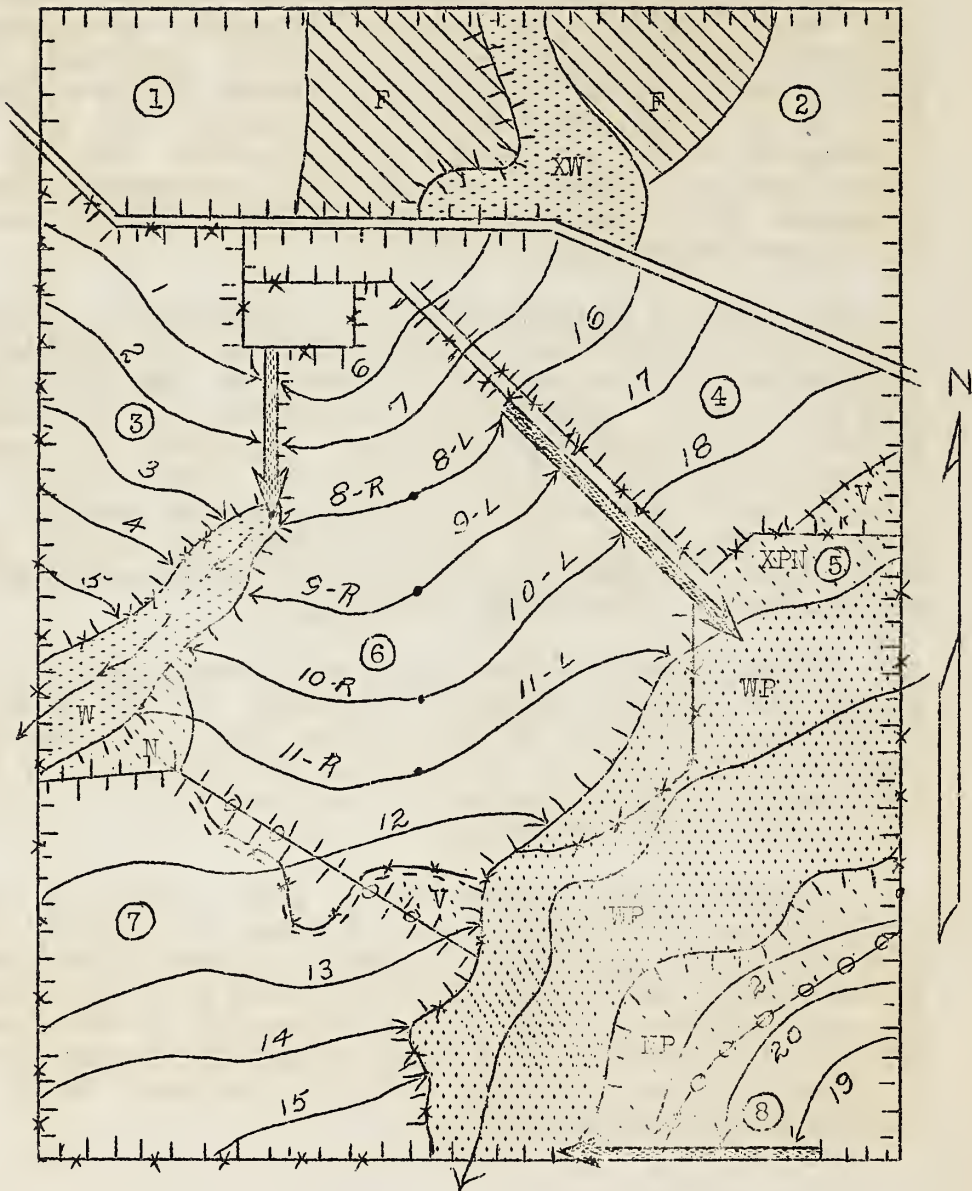
In making recommendations and surveys for these mechanical devices, the economic value of the land and the expense of construction are given due consideration. Natural outlets are used where possible to avoid construction of comparatively expensive artificial waterways. It was found necessary on this farm to install terracing systems to protect fields numbers, 3,4, 6,7, and 8. Natural outlets were not available for all of the terraces so it will be necessary to incorporate into the system three discharge channels or artificial waterways. These are indicated by the heavy lines between fields 4 and 6, 3 and 6, and on the southern boundary of field 8.

The location of these channels is decided upon as the system is worked out. Their size (width and depth) is computed after calculations have been made to determine the quantity of water they will have to carry from the system, as planned. These channels are protected by mechanical structures in such a way that the water will be conducted down the slopes with a minimum of soil loss to a point where it will have no further erosive action. These channels are usually located in natural drainage ways or where necessary on land lines and their construction does not materially hinder farming operations.

As the system is worked out by the survey party, it is drawn in on the map as shown. The location of the channels are indicated. Each terrace is numbered and the direction of flow indicated. The length of each terrace is tabulated and a copy of this completed map is given to the cooperator and one is kept on file in the engineer's office.

After the engineering work has been completed as above described the construction of the terrace and outlet work is conducted by the engineering department in conformance with their specifications for terrace and outlet work. The actual construction work performed is done at such a time that it will cause a minimum of interference with the cooperator's farming program and when completed the fields are left in a condition to be worked satisfactorily by the farmer.

PLAN OF TERRACE SYSTEM



Field Nos.

Terrace lines

Outlet Channels

③

8-R



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